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PRELIMINARY NOTES ON AFRICAN CARNIVORA

BY J. A. ALLEN

The purpose of these notes is to secure early record for certain results obtained in a study of some 600 specimens of African Carnivora collected by the American Museum of Natural History Expedition in Belgian Congo during the years 1909–1915, under the leadership of Herbert Lang and James P. Chapin of the scientific staff of the Museum, as the final report, now practically finished, will be delayed in publication. These notes relate in part to some of the more interesting of the new forms thus disclosed and in part to questions of taxonomy and nomenclature. The full report will include numerous illustrations, from pen drawings, of the cranial and external characters of not only the new forms but also of the principal generic types of the Viverrinæ and Herpestinæ represented, and numerous reproductions of field photographs of specimens in life or in the flesh, and photographs from skins illustrating individual color variation, for which large series of specimens from single localities afford abundant material.

These preliminary notes are here published with the approval of the American Museum authorities. The full report will form part of Volume XLII of the Museum *Bulletin* which will be exclusively devoted to the Congo collection of mammals. The first part of this volume, containing the report on the Insectivora, is already in press.

Genus *Aonyx* Lesson

Lutra (part) most authors prior to 1900.

Aonyx LESSON, *Man. de Mammalogie*, 1827, p. 157. Type, by monotypy, *Aonyx delalandi* Lesson (1827) = *Lutra inunguis* F. Cuvier (1823) = *Lutra capensis* Schinz (1821).

Anahyster MURRAY, *Proc. Roy. Phys. Soc. Edinburgh*, II, 1860, p. 157. Type, by monotypy, *Anahyster calabarica* Murray, sp. nov., from Old Calabar, West Africa. GRAY, *Proc. Zool. Soc. London*, 1865, p. 129. (As a sub-genus of *Aonyx*; restricted to the clawless otters of Africa.)

Aonyx (part) GRAY, *Proc. Zool. Soc. London*, 1865, p. 129. (Restricted to the Indian clawless otters.) THOMAS, *Ann. Mag. Nat. Hist.* (8), I, 1908, p. 387. (Part; includes both the African and Indian species.)

The genus *Aonyx* Lesson was exclusively based on the so-called clawless otter of the Cape region of South Africa (*Lutra capensis* Schinz, renamed *Aonyx delalandi* by Lesson), of which the genus *Anahyster* Murray, based on a clawless otter from Old Calabar, is a synonym.

Notwithstanding the great specialization of its type, *Aonyx* did not receive general recognition as a genus till the present century. J. E. Gray, in 1865 and later, recognized *Aonyx* as a full genus, but he combined with the *Aonyx capensis* group the clawless otters of southern Asia. More than this, he divided *Aonyx*, as he recognized it, into two groups, and wrongly assigned his restricted *Aonyx* to the Asiatic species and adopted *Anahyster* for the African species, the only species originally included in *Aonyx*.

Lesson, the founder of *Aonyx*, proposed *Leptonyx* in 1842,¹ for the clawless otters of Asia, a name unfortunately doubly preoccupied, first for a genus of birds (Swainson 1821) and later for a genus of seals (Gray 1837). Both groups are entitled to full generic acceptance, according to standard modern opinion as to what constitute generic differences among mammals. *Aonyx*, however, has hitherto stood for both groups, whenever used in either a generic or a subgeneric sense.

While the foot structure of the clawless otters of Africa and the small-clawed otters of Asia is similar, the external and cranial characters, including the dentition, are widely different in the two groups. Yet the clawless Asiatic otters have been, and are still, referred to *Aonyx*, when not placed in *Lutra*, and, with one exception, all the figures that I have seen purporting to give the cranial and dental characters of *Aonyx* have been based on the skulls of Asiatic forms. Hence a non-typical and, from my viewpoint, a non-congeneric form not originally included in the genus has been taken to typify *Aonyx*, so far as the literature of the group is concerned.²

Micraonyx nom. nov.

Leptonyx (subgenus of *Lutra*) Lesson, Nouv. Tableau Règne Animal, Mamm., 1842, p. 72. Type, by tautonymy, *Lutra leptonyx* Horsfield = *Lutra cinerea* Illiger.

The name *Leptonyx* is preoccupied by *Leptonyx* Swainson (1821) for a genus of birds, and by *Leptonyx* Gray (1837) for a genus of seals. It is here replaced by *Micraonyx*.

While the external differences are by no means insignificant, those of the skull and teeth are such as most taxonomers consider as of high

¹ Nouv. Tableau Règne Anim., Mamm., 1842, p. 72.

² See, for example, the well-known figure in Flower and Lydekker's 'Mammals Living and Extinct,' 1891, p. 568, fig. 261, "of the palate of *Lutra cinerea*," reproduced from 'Palæontologia India.'

importance. Some of these differences have not escaped record, but this fact has not directed to them the attention they deserve. While at first glance the skulls of *Aonyx* and *Micraonyx* appear to have many features in common, they differ greatly in proportions and in the relative size of corresponding teeth. In *Aonyx* the antorbital portion of the skull is heavily developed, being broad, with large incisors and canines, while the carnassials and molars are only moderately developed in proportion to the size of the skull; all these conditions are reversed in *Micraonyx*. In the latter the facial portion of the skull is narrow and weak, with small incisors and canines, while the carnassials and molars are enormously developed for the size of the skull, these teeth about equalling those of *Aonyx*, which has a skull fully three times the bulk of the skull of *Micraonyx*. This creates a vast difference in the relative breadth of the palatal space between the carnassials and molars of the maxillary series, which in *Micraonyx* is much less than the transverse breadth of m^1 , while in *Aonyx* this space is one and a half times greater than the transverse breadth of m^1 .

*Osbornictis*³ gen. nov.

Type, *Osbornictus piscivora* sp. nov.

Skull long and lightly built; teeth small, especially the carnassials and upper molars, with correlated size reduction in all the other teeth. Sagittal and lambdoid crests and postorbital processes highly developed. Rhinarium small, without a median sulcus. Soles and palms bare, not furred as in *Genetta* and allied genera. Color of body uniform red; tail black; head-markings white; wholly without the black spots and bands so characteristic of the other *Viverrinae*. Habits piscivorous.

Osbornictis is most nearly related to *Genetta*, from which however it strikingly differs. It requires comparison with no other genus. The type agrees closely in size with *Genetta victoriae*, the largest of the genets.

Osbornictis piscivora sp. nov.

Type, No. 51514, ♂ ad., Niapu, Belgian Congo, December 1, 1913; Herbert Lang and James P. Chapin, American Museum Congo Expedition. Orig. No. 2147. Skin and complete skeleton.

³ Named for Professor Henry Fairfield Osborn, President of the American Museum of Natural History, whose deep interest in the American Museum Congo Expedition contributed greatly to its success in the field and later toward the early publication of its scientific results.

External measurements about as in *Genetta victoriae* Thomas, but soles and palms naked, and coloration radically different; skull slender, dentition weak, the teeth about half the transverse diameter of the corresponding teeth in *G. victoriae*.

Entire upperparts uniform dark chestnut red, without trace of spots or bands; this color, in reduced intensity, extends over the underparts from the pectoral region to the base of the tail, lightening to dull red mesially with a slight mixture of whitish hairs along the midline of abdomen; head from muzzle posteriorly and laterally to the eyes, pale fuscous brown with a tinge of reddish, broken by a pair of elongated spots of clear white between the eyes divided by a narrow fuscous band, and a narrower, more indistinct posterior pair between the anterior base of ears; a narrow black eyering; front and sides of muzzle and sides of head below eyes whitish, intensified to a clear white spot just below the anterior two thirds of each eye; ears exteriorly blackish, which color extends mesad over the lateral third on each side of the crown; ears nearly naked internally and edged with long whitish hairs; chin and throat white, passing into brownish posteriorly with scattered whitish hairs on the foreneck; tail entirely without annulations, heavily clothed with long black hairs, 45-50 mm. in length, the heavy underfur pale brownish gray, about 25-30 mm. in length; fore and hind limbs dull slightly rufescent brown, passing into blackish brown on upper surface of feet. Rhinarium similar in contour to that of *Genetta victoriae*, but about one half smaller. Soles and palms naked, the pads not enclosed nor separated by dense fur, as in *Genetta* and *Civettictis*, with the carpal pad greatly elongated as in *Viverricula*. Pelage long and dense, that of the tail especially so, its tail equal in size to that of the most heavy-tailed examples of *G. victoriae*.

Represented by the adult male type (skin and complete skeleton) and an imperfect native-made skin (without skull, feet, or tail), similar to the type in coloration, length of body, and in head-markings, except that the latter are yellowish through staining instead of white. (Measurements and illustrations of the cranial and external characters and a colored plate of the animal will appear in the final report on the Congo Carnivora.)

Xenogale gen. nov.

Type, *Xenogale microdon* sp. nov.

Toes 5-5; soles and palms furred; dental formula, relative size and general structure of the teeth as in *Herpestes* (s.s.); skull relatively short and broad, postpalatal region especially so; postorbital constriction deep and close behind the postorbital processes; braincase short, proportioned about as in *Ichneumia*, very different in form from the braincase of *Herpestes*; tail short and thick, as in *Ichneumia* and *Atilax*, in contrast with the long slender tail of *Herpestes*, in which the heavily haired portion is restricted to the basal third.

Xenogale presents a singular combination of characters. Externally it strongly resembles *Atilax*, particularly in the texture and coloration of the pelage, and in the field was mistaken for an *Atilax*, but in cranial characters and in dentition the two forms present little

similarity. It resembles *Ichneumia* in external form, in its long heavy overhair, and in having furred palms and soles, thus differing in this latter respect from both *Herpestes* and *Atilax*. It has the light and rather weak dentition of *Herpestes*, but the skull is relatively much shorter, broader and heavier than in the latter, with the postpalatal region correspondingly shorter and wider. The short, thick tail also contrasts strongly with the attenuate tail of *Herpestes*.

Xenogale microdon sp. nov.

Type, No. 51625, ♂ ad., Akenge, Belgian Congo, December 4, 1913; Herbert Lang and James P. Chapin, American Museum Congo Expedition. Original No. 2194.

Small-toothed, with a general external resemblance to the *Atilax* group.

Upper parts of body with the overhair black broadly annulated with rufous, giving a grizzled effect of deep black and ochraceous orange; the individual hairs are light at base passing into black, the outer half black ringed and tipped with ochraceous or wholly black; underfur pale buff, darker at extreme base; tail like [the back at base, becoming lighter apically without distinctive change (to black or white) at tip, the hairs individually buff at base, broadly ringed with black near the middle and subapically ringed with whitish; limbs uniform brownish black to intense black (in different individuals); head distinctly lighter than body, the hairs short and conspicuously tipped with whitish, giving a grizzled grayish effect; ventral area similar to the back but more suffused with rufous which prevails over the black; foreneck from the axillar line to lower part of the throat blackish the hairs conspicuously tipped with whitish, giving a grizzled effect; chin, sides of head and top of nose with a brownish tone, the hairs extremely short; palms and soles bare as in *Ichneumia*. (A fuller description, with detailed measurements and illustrations of cranial and external characters, will appear in the final report on the Congo Carnivora.)

THE GENERIC NAMES MUNGOS AND HERPESTES

The specific name *mungo* dates from Gmelin, 1788 (Syst. Nat., I. p. 84), *Viverra mungo* being the second species of his genus *Viverra*. His *Viverra mungo* was based primarily on the banded mongoose of Africa, although the habitat is given as India, and references to various indeterminate Asiatic species are included among his bibliographic citations under *V. mungos*.

As no diagnosis is given by which the species can be identified it must be determined by the first identifiable reference. The first reference is "Schreber, Säugethiere, III, p. 430, t.CXVIA, CXVIB." Schreber's plate CXVI is an accredited copy of Buffon's figure of "La Mangouste." Buffon and Daubenton supposed that their specimens

came from India, but no definite place of origin is mentioned for any of the several specimens mentioned by them. Hence for the next half century Buffon's "La Mangouste" was believed to be an Indian species. It was not till 1835 that Daubenton's plate and description were recognized as based on the banded mongoose of Africa, currently known in technical literature as *Crossarchus fasciatus* (Desmarest).

In 1803 E. Geoffroy, in his 'Catalogue des Mammifères du Museum nationale d'Histoire naturelle' (Paris), redescribed 'La Mangouste' of Buffon and Daubenton from the specimen which served as the basis of the original description, under "La Mangouste de l'Inde, *Ichneumon mungo*," giving its distinctive characters as "Pelage varié de roux et de noir, par zones transversales; queue pointue; pieds pentadactyles." Among his citations are "La Mangouste, Buff. Daubt. t. 13, pp. 150-160, pl. 19," "*Viverra mungo*, Schreber, tabl. 116," "*Viverra mungo*, Lin. Gmel., p. 84, pl. 7." Then follows a detailed description, its "patrie" ("Les indes orientales"), the number of the specimen in the catalogue of the Museum ("No. cccxiv"), followed by the remark: "Individu qui a servi de sujet pour la descript. précédente, et celle de Buffon." The identity of the original La Mangouste is thus thoroughly established.

Desmarest, in his 'Mammalogie' (I, 1820, p. 211), gave essentially the same description, based doubtless on the original type-specimen, under the names "Mangouste à bandes, *Herpestes mungo*." Three years later (Dict. Sci. nat., XXIX, 1823, p. 58) he changed the technical name to *Herpestes fasciatus*, because the name *mungo* was not "classical." He repeats the geographical error: "La mangouste à bandes est particulière à l'Inde." Fischer (Syn. Mamm., 1829, p. 163), six years later, under *Mangusta mungo*, says: "Hab. in India orientali." In fact, the real habitat of La Mangouste, alias Mangouste à bandes, was first made known by Ogilby in 1835, when in an account of a collection of mammals collected in Gambia (Proc. Zool. Soc. London, 1835, 101), he says: "Mr. Rendall has brought over specimens of two *Herpestes*, one of which, the *Herpestes Mongos* of Linnaeus, very well figured and described by Buffon (Hist. Nat., tom. xiii, tab. 19), deserves to be noticed, for the purpose of correcting the habitat of the species, which, upon Buffon's authority, has hitherto been given as India, but which Mr. Rendall's specimens clearly show to be the west coast of Africa. The mistake originally arose from Buffon's having identified the *Mangouste à bandes*, the species under consideration, with the *Mongos* of Kämpfer, unquestionably an Indian

species (the *Herpestes griseus* of authors), and still commonly called by that name in Upper India, where many natives and Europeans keep it in a semidomestic state, for the purpose of destroying vermin.

."

Thomas, in 1882, in his important paper 'On the African Mongooses' (Proc. Zool. Soc. London, 1882, pp. 59-93, pl. iii) said, under *Crossarchus fasciatus* (l. c., p. 91): "This species by its locality, and not *C. zebra*, no doubt represents the early-known '*Viverra mungo*' which was said to come from the 'East Indies.' No cross-striped Mongooses, however, are known from India, and the original specimens must have been obtained from the Cape. Probably, however, tame examples were sometimes brought down to Capetown, where they would be seen by the earlier travellers." Thomas was so fully convinced that the *Viverra mungo* Gmelin is the *Crossarchus fasciatus* of later writers that he felt called upon to explain in a footnote his reason for ignoring the rule of priority in this case and accepting *fasciatus* instead of *mungo*, as follows: "This name '*mungo*' is so utterly barbarous, and that of *fasciatus* so well known, that I think we are justified in ignoring it and using Desmarest's classical and appropriate term" (l. c., footnote to p. 90).

The status of *Viverra mungo* (= La Mangouste of Buffon and Daubenton) has a vital bearing on the correct application of the generic name *Mungos*, revived in 1907 to replace *Herpestes* Illiger (1811). It also has an equally important bearing on the specific name of the 'Common Mongoose' of India.

The genus *Mungos*, like many of the early genera of post-Linnean origin, was introduced rather informally and without much detail by E. Geoffroy and G. Cuvier in their 'Memoire sur une nouvelle division des Mammifères' in the 'Magasin Encyclopédique' in 1795. This memoire is stated by the authors to be merely a sketch or outline to be amplified later, and that some of the genera are presented provisionally. The higher groups are only briefly characterized, and their content indicated by an enumeration of the genera, designated only by vernacular names, followed by technical names in parentheses, of the species respectively referred to them. The following are examples from the Plantigrades (l. c., p. 184): " les ours (*ursus*, L.); les rats (*ursus lotor*, L.); les coatis (*viverrae nasua*, *narica*, *tetradactyla* et *vulpecula*, L); les blaireaux (*ursus meles*, etc); les mangoustes (*viverra ichneumon* et *mungos*):"

The 10 genera referred to the Plantigrades follow in a single column, the vernacular names standing first and the technical equivalent following it in parenthesis, thus:

"Ours (<i>Ursus</i>).	Coati (<i>Nasua</i>).
Raton (<i>Lotor</i>).	Kincajou (<i>Potos</i>).
Glouton (<i>Gulo</i>).	Taupe (<i>Talpa</i>).
Blaireaux (<i>Taxus</i>).	Musaraigne (<i>Sorex</i>).
Mangouste (<i>Mungos</i>).	Hërrisson (<i>Erinaceus</i>)."

Four of these genera are credited to Linne; two (*Gulo*, *Nasua*) date from Storr (1780); the other four (*Lotor*, *Taxus*, *Mungos*, *Potos*) first appear here, but two of them are antedated by names given by Storr (*Lotor* by *Procyon*, *Taxus* by *Meles*), leaving two, *Mungos* and *Potos*, both in current use. *Potos* was monotypic, with "*Viverra caudivolvula*, L." as type. *Mungos* contained two species, *Viverra ichneumon* Linné and *Viverra mungo* Gmelin. *Viverra mungo* is therefore automatically the genotype of *Mungos*. Furthermore, *Viverra mungo* is not a species of *Herpestes* Illiger (type, *Viverra ichneumon* Linné, by several "subsequent designations"), it being noncongeneric with the genotype of *Herpestes*.

As already shown 'La Mangouste' of Buffon and Daubenton is the banded mongoose of Africa, the *Crossarchus fasciatus* of current nomenclature, which should henceforth bear the name *Mungos mungo* (Gmelin). *Ariela* Gray (1864) is a synonym of *Mungos*, having been especially founded for the South African banded mongoose (*Ichneumon tæniotus* A. Smith) under a misapprehension of its real characters. *Mungos* of Gray (Proc. Zool. Soc. London, 1864, pp. 575-577), it singularly happens, is essentially the *Mungos* of Geoffroy and Cuvier, although Gray apparently knew nothing of the *Mungos* of these earlier French authors, this agreement being apparently a coincidence. Under his *Mungos fasciatus* Gray placed *Herpestes mungo* Desmarest, thus rendering this species, under modern rules, automatically the genotype of his genus *Mungos*.

The restoration of *Mungos* to its proper place in nomenclature need not in the least disturb the stability of *Crossarchus* F. Cuvier (1825), which has, by monotypy, *Crossarchus obscurus* F. Cuvier as its genotype, for which and later described allied forms it should be retained. As thus restricted *Crossarchus* forms a group very different from the banded mongooses for which *Mungos* is available and to which it should be restricted. Gray showed good judgment in separating the two

groups generically. Attention has recently been called to the generic distinctness of these groups by Pocock⁴ he adopting for the banded mongooses Gray's unavailable name *Ariela*. He also calls attention to the fact that the inclusion of the two groups under *Crossarchus* was due to erroneous information concerning the structure of the anal glands. Before meeting with Pocock's paper I had become strongly impressed with their incongruity and their evident generic distinctness.

Herpestes Illiger (1811), genotype,⁵ *Viverra ichneumon* Linné, after almost universal employ for three fourths of a century, was hastily and, as it now appears, needlessly displaced in 1907⁶ by *Mungos* Geoffroy and Cuvier and immediately the latter became current for the greater part of the mongooses of both Africa and Asia. It should now be returned to its time-honored place in nomenclature, through the allocation of *Mungos* to its proper station.

As already shown, not only is *Mungos* untenable as a genus name for any Indian mongoose, but also the species name *mungo* is equally a misnomer when applied in the same connection, it belonging unquestionably to the banded mongoose group of Africa.

A NEW SUBSPECIES OF BEAVER FROM NORTH DAKOTA

BY VERNON BAILEY

In attempting to identify the beavers of North Dakota, for inclusion in my report on the mammals of the State, I find it necessary to apply a new subspecific name to those occupying the Missouri River drainage. Strange to say the specimens show closer affinity with those of the Rio Grande drainage, than with those in the same State in the streams flowing into Hudson Bay. Under permit from the State Game Commission, I was allowed to collect two specimens in Apple Creek, about 7 miles east of Bismarck, and there are a number of additional skulls from along the Missouri and Little Missouri Rivers. While it is very desirable to obtain more material, and especially skins taken at

⁴ On the severance of *Ariela* Gray (= *Mungos* s.s.) from *Crossarchus* see Pocock, Proc. Zool. Soc. London, 1916, p. 350 and text figures on pp. 353, 356, 360, 369.

⁵ By subsequent designation, Anderson, Yunnan Exped., 1878, p. 171; Thomas. Proc. Zool. Soc., 1882, p. 63.

⁶ Cf. Thomas, Ann. Mag. Nat. Hist. (7), XX, p. 119, footnote.